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Metropolitan Toronto

Planning Department

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May 15, 1984



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TO: THE ECONOMIC DEVELOPMENT AND PLANNING COMMITTEE

RE: CLEAN FILL DISPOSAL STUDY

Origin

In considering a report on the future of the Leslie Street Spit, the City of Toronto Council adopted the following recommendation:

"That Council request the Metropolitan Toronto Commissioner of Planning, in conjunction with the City of Toronto's Commissioner of Planning and Development and the Commissioner of Public Works, representatives from other Metropolitan Cities or Boroughs, and the Metropolitan Toronto and Region Conservation Authority, as well as any other interested bodies, to immediately commence a study to identify options for the disposal of construction and other fill materials generated within Metropolitan Toronto, and submit a progress report on this matter within 6 months to Metropolitan, City and Borough Councils."

This request was referred to the Technical Advisory Committee on Parks and Conservation (T.A.C.P.A.C.) which has on previous occasions dealt with the question of clean fill disposal, particularly through landfill operations in Lake Ontario. T.A.C.P.A.C. directed that staff of the Metropolitan Works and Planning Departments, in consultation with appropriate City of Toronto staff, initially investigate the scale of the problems anticipated and report back to the Committee. An investigation was undertaken and discussions were held with representatives of the construction industry, the Toronto Harbour Commissioners, and government agencies, including all area municipalities. This report which summarizes such investigation, was recently reviewed and approved by the Technical Advisory Committee on Parks and Conservation, and, accordingly the recommendations thereof are now submitted for the consideration of the Economic Development and Planning Committee.

Background

The Leslie Street Spit or Eastern Headlands have been under development by the Toronto Harbour Commissioners for over 20 years, as part of a long-range plan to create an outer harbour for the Port of Toronto and to protect the Eastern gap. During that time just over 20 million cubic yards of fill have been deposited to

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create the 'spit' which extends 3½ miles into Lake Ontario from the foot of Leslie Street.

Figure 1 indicates the annual rate of fill disposal since 1971 for all lakefill sites in operation during that time, as well as the volumes received at the Spit and those directed to the other lakefill sites which are now essentially complete. Data for Sam Smith Park are not included since the operation began in late 1983. As indicated, the rate of dumping in lakefill sites has fluctuated widely, depending on the level of construction activity in the Metro area. The fluctuations have ranged from a low of 754,395 cubic metres in 1979 to a high of 1,934,810 cubic metres in 1973, averaging 1,344,602 cubic metres over the 12 year period. During that time a total of 17,256,074 cubic metres of fill were disposed of in the lakefill sites, of which 8,274,000 cubic metres were received at the Spit. Studies in 1980 indicated that the bulk of fill received at the Leslie Street Spit originated from the Central Area of Toronto. No similar information is available for the other lakefill projects.

A final configuration for the "Spit" has now been determined. At the present rate of dumping it is estimated that no more clean fill will be accepted after 1986 although rubble for armouring will continue to be required after that time.

Definition of Problem

Initial investigation by staff of the City of Toronto, based on monitoring conducted by the Ministry of the Environment, indicated that the bulk of fill accepted at the Spit originates from the Central area of the City of Toronto. Concern was expressed that with the closing of the Spit, no other sites may be available for disposal, or if available, that volumes from Toronto may result in undue competition for disposal sites in the Toronto Region.

The disposal of excavated material from construction sites is not regulated by any level of government (except for the exclusion of contaminated fill from lakefill projects) since it is generally not considered a hazardous waste. This situation is unlikely to change substantially. The Blueprint for Waste Management, recently published by the Ministry of the Environment, in discussing use of excavated materials indicates that they are capable of being recycled as backfill and states: "It is expected there would be no barriers to utilization in most cases, although more care would be needed in the handling and placement of material in waterbodies". The Blueprint suggests that guidelines will be prepared for handling and disposing of backfill and that the role of the municipality will be clarified in this regard.

However, as a result of the present lack of regulation, no accurate records of production volumes or the location of disposal sites (particularly of those small public and private sites which require clean fill for limited periods of time) are available.

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Discussions with area municipalities yielded rough projections of fill volumes from private construction and public works projects. These projections, shown on Table 1, are based on estimates of past performance as well as the anticipated rate of development. The volumes indicated reflect anticipated levels of construction activity as well as different site development standards in the area municipalities. For instance, major residential and office developments in Toronto frequently include below grade retail facilities, generally have all parking underground and provide little or no on-site landscaping. With few exceptions, developments in the other municipalities locate a larger proportion of parking at grade resulting in shallower excavations and on-site landscaping allows the use of fill for berms or contouring.

Taking these factors into account, Table 1 indicates that Toronto will account for half the clean fill generated within Metropolitan Toronto and that the total annual production in Metro (1.4 million cubic metres) will approximately equal the amount deposited at the Spit in 1981, when the highest volumes were recorded.

With the exception of municipal officials in Toronto, the municipal officials interviewed had no definite knowledge of which disposal sites are used by private contractors and did not perceive any serious problems related to the disposal of clean fill from construction sites. Disposal of fill from municipal public works was of concern, particularly in dealing with contaminated refuse (e.g. catch basin cleanings). Etobicoke, North York and York operate their own disposal sites for clean fill but these have limited capacity. The other municipalities use various Metro/M.T.R.C.A. sites for disposal of clean fill. All municipalities truck their contaminated fill to one of the Metropolitan land fill sites.

In addition to considering the availability of disposal sites, the majority of municipal officials contacted suggested that a problem may exist in relation to the disposal of contaminated soils.

At present, contaminated fill is excluded from lakefill projects under the Lakefill Quality Assurance Program (L.Q.A.P.) administered by the Ministry of the Environment. Under that program soil analysis may be required by M.O.E. for any development proposed in the area south of Queen Street, between Roncesvalles and Leslie Street as well as on specified former industrial sites in Toronto. If contaminants are found to exist the contractor is denied access to lakefill disposal sites.

Guidelines, administered by the area municipalities, have also been established by M.O.E. for the redevelopment of old landfill sites.

Table 1

ESTIMATED ANNUAL QUANTITIES OF EXCAVATED MATERIAL*
METROPOLITAN TORONTO 1984-2000

Area Municipality	Source		Projected Generation Rate
	Public Works	Private Development	
East York	30,000 m ³	30,000 m ³	60,000 m ³
Etobicoke	42,000	244,000	286,000
North York	63,000	68,000	131,000
Scarborough	57,000	100,000	157,000
Toronto	91,000	620,000**	711,000
York	30,000	30,000	60,000
ANNUAL METROPOLITAN TOTAL			1,405,000 m ³

* Consisting of sand and rubble materials (rubble accounts for 7-10% of total volume)

** Extrapolation of Leslie Street Spit figures, less 10% to compensate for sources originating outside of Toronto

While these programs reduce the potential for water pollution and seepage of methane gas, two weaknesses were perceived to exist. Firstly, contaminated soils may exist in other older areas of Metro (former paint, chemical or metal fabricating plants) which have not been identified; and secondly, while material from identified sites is excluded from lakefill projects, no constraints exist on other disposal sites which may be used. Dumping into a worked out gravel pit could result in pollution of ground water supplies. A process should be established by M.O.E. to identify areas of potential contamination and to ensure that such materials are dumped at a Metropolitan landfill site or similarly licensed disposal area. The initial procedure could be administered by M.O.E. as an extension of the L.Q.A.P. program, with the requirement that proof be supplied by the contractor that contaminated fill has been dumped at an approved landfill site. Administration of L.Q.A.P. at present requires less than one person full time. Expansion of the program is unlikely to substantially increase staff requirements, since relatively few sites would be involved.

Disposal Facilities

Staff of the Toronto Harbour Commissioners confirmed that no plans exist to continue receiving clean fill at the Spit after the expiration of the approved program in 1986. It was suggested, however, that lakefilling in other locations should be undertaken to provide both disposal sites for clean fill and additional recreational land along the waterfront. Water pollution from fill operations was not perceived as a problem in view of the introduction of the L.Q.A.P. program. However, representatives of the Conservation Authority (M.T.R.C.A.) and the Metropolitan Parks and Property Department indicated that, apart from completion of the Sam Boise Smith Project in Etobicoke, no additional lakefill projects are under active consideration. The relatively high cost of developing parkland through lakefill (about \$80,000 per acre) and the expense of producing an environmental assessment (\$346,000 for Sam Smith) were cited as impediments. Should this position be reconsidered, lakefill projects in the Scarborough-Ajax sectors of the waterfront are the most likely to be considered next in a program of waterfront park development.

Appendix 1 identifies existing and potential fill disposal sites in the Metro area. The list is by no means complete insofar as excavation companies may contract directly with a private landowner to dump clean fill and small sites (on both public and private land) open for short periods of time.

Of the existing municipal sites, only the Metro landfill sites receive material from private sources. At the Metro sites, contaminated soils may be deposited for the standard fee of \$15.50 per tonne. Clean fill can be used as cover and is received free. At times, the Works Department has experienced a shortage of clean fill. The Maple site presents a particular opportunity in that the cover material stock piled at the site is clean sand which could be sold if sufficient clean

fill were available as a substitute. The three other publicly operated lakefill sites in and around Metro have limited capacity. Sam Smith Park, for instance, is expected to be complete within about 4 years. The three private sites are expected to be in operation for a number of years.

The list of potential sites indicates several which are within or relatively convenient to the Central Area of Toronto. All, except the Conservation Authority sites, which require environmental assessments, could be in operation within a few years.

Estimates on capacity or duration of operation were difficult to obtain. The general opinion seemed to be that the existing and potential sites listed had sufficient capacity for the foreseeable future (10 years). This viewpoint was based on the following considerations: parking requirements for the Central Area have been reduced so that fill production may be below the projection based on previous volumes to the Spit; only a portion of the fill generated in the suburban areas is removed from the site; an unknown quantity of fill at present is disposed of at small construction sites, in low lying areas or used for berms and landscaping.

Appendix 2 presents an inventory of pits and quarries within 25 kilometers of downtown Toronto. As urban development spreads, the desirability of full rehabilitation of these sites will increase, providing additional fill disposal capacity.

Disposal Costs

The average fee charged for fill disposal at major sites is \$10.00 per truckload. In the case of lakefill projects this includes the on-site costs of administering the L.Q.A.P. program. As previously mentioned, clean fill is received without charge at the Metro landfill sites and \$15.50 per tonne is charged for contaminated fill.

However, the major cost of fill disposal relates to transportation costs. Members of the excavation industry estimated that a round trip from downtown to a lakefill site takes about one hour and costs approximately \$40.00, including the dumping charge. Another economic factor to be considered is the need to keep excavation machinery in continuous operation. Based on a one hour round trip, 12 trucks are needed to service the average construction project. Larger capacity machinery, or longer turn around time requires a proportional increase in trucks. Appendix 3 indicates estimated travel times to a number of landfill sites in and around Metropolitan Toronto.

Several years ago the Toronto Construction Association engaged Currie, Coopers and Lybrand Ltd. to examine the effect on the construction industry of closing the Spit. While the dollar estimates are now out-of-date, the report

suggests that trucking fill from a downtown site to Pickering or Maple is two and half-times more expensive than to the Spit. In 1977 dollars this translated into a cost of \$1.5 to \$2.4 million for lakefill dumping of debris from Eaton Centre as opposed to an estimated \$4.2-5.1 million if the Maple or Pickering sites were used. While the unit cost differential is large, excavation accounts for less than 1 per cent. of total construction costs for a building. However, it is recognized that with respect to municipal projects such as road and sidewalk reconstruction, such excavation costs as a percentage of total construction costs are much higher.

Alternative Solutions

There is no clear evidence of an immediate shortage of clean fill disposal sites around Metropolitan Toronto. However, it is apparent that, in the absence of new lakefill projects, increased costs caused by longer hauls will occur.

During the course of discussions two respondents suggested that public agencies should be actively involved in providing disposal sites; the remainder were strongly of the opinion that increased costs should be borne by the construction industry and public intervention should occur only in regulating the disposal of contaminated soils. However, several techniques to alleviate the potential problem were put forward as indicated below:

- Reduction in the depth of below grade construction would reduce the amount of fill generated. This may result in above ground parking structures, as occurs in a number of North American centres. From the standpoint of urban design this is not a desirable solution insofar as it would increase building bulk and reduce the availability of street level retail facilities. Reduction in other sub-grade facilities (shops, subway connections, pedestrian malls) is similarly undesirable since these features have increased the winter livability of Toronto. However, some benefit will accrue from the recent reduction in parking requirement in the core area.
- Where development standards permit, increased on-site use of fill for landscaping could increase the attractiveness of development as well as reducing construction haulage costs.
- A proposal to 'twin' the excavation and aggregate industries warrants further investigation. At present, sand and gravel trucks return to the pits empty. If it were possible for these trucks to return with clean fill which could be used for rehabilitation of the pit, the additional costs of the longer haul would be offset by reduced trucking charges. However, there seem to be a number of problems inherent in implementing this proposal: the timing of the excavation and construction activities do not co-incide so that centrally located depots where fill can be stockpiled may be required; dual truck use may not be feasible if it results in contaminating aggregate with other material; some union agreements may not permit this innovation.

- Further exploration of the topic requires a practical knowledge of the two industries. Therefore, it is probably more appropriate that the aggregate and excavation associations undertake such an investigation if they so desire.
- Increased recycling of some material (concrete, asphalt) would result in reduction in the volumes requiring disposal sites. It is estimated that 7-10 per cent. of excavated material can be recycled.

Conclusion

The study has not revealed any serious deficiencies in the availability of clean fill disposal sites for the near future. It is estimated that there are at least 50 pits within a 25 km radius of Toronto which, given projected rates of construction, should provide sufficient capacity for the next 10 years. In addition, if the M.T.R.C.A. waterfront park development program resumes, new lakefill sites which are readily accessible to the central area would be made available.

However, fluctuations in the rate of construction or difficulties in utilizing the available sites could change the present outlook. Given the lead time required to satisfy the regulations of the Environmental Assessment Act where lakefilling is contemplated, periodic monitoring of the situation should be undertaken by Metropolitan staff.

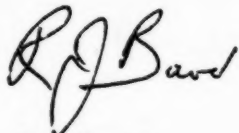
A problem identified in the course of the study is the need for better regulation of the identification and disposal of contaminated soils.

Recommendations

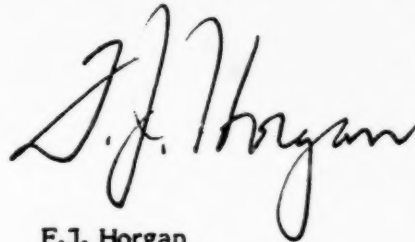
It is recommended that:

- (1) the City of Toronto be informed that this investigation has not revealed a serious deficiency for the near future in the availability of clean fill disposal sites within the Metropolitan Toronto region; Metropolitan Toronto staff, however, recognize the need to monitor the situation from time to time so as to be able to respond appropriately should the situation change in the future;
- (2) the Ministry of the Environment be requested to expand the L.Q.A.P. program by identifying additional sites within Metropolitan Toronto where contaminated soils may exist, and by ensuring that contaminated soils are deposited in approved landfill sites; and

- (3) that this report be forwarded to the Aggregate Producers Association of Ontario, the Toronto and District Excavators Association, Area Municipalities and other interested agencies for their information and any comments they may have.



R.J. Bower
Commissioner of Planning



F.J. Horgan
Commissioner of Works

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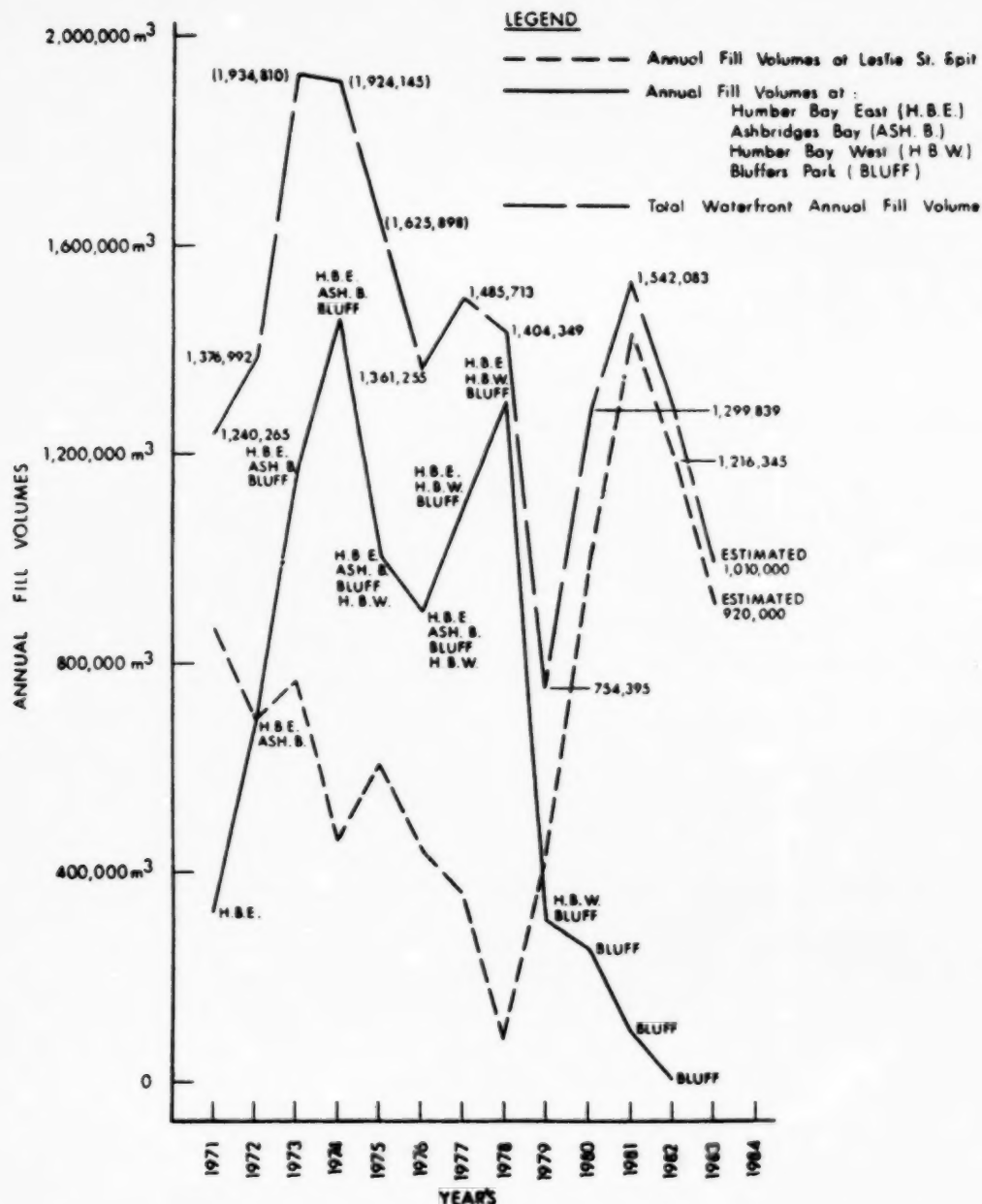


FIGURE : 1
ANNUAL FILL VOLUMES
ALONG WATERFRONT

APPENDIX 1
EXISTING FILL DISPOSAL SITES

	Operated By	Capacity/ Duration	Remarks
<u>Municipal</u>			
Keeleisdale	City of York	limited	Restricted to municipal disposal
Emery Road	City of North York	limited	Restricted to municipal disposal
Cook Creek	City of North York	limited	
Horner Avenue	City of Etobicoke	4 years	Restricted to municipal disposal
Beare Road	Metropolitan Toronto	limited	Receiving clean fill
Brock West	Metropolitan Toronto	0.2 m daily	Predominantly used for refuse disposal
Maple (Keele valley)	Metropolitan Toronto	0.2 m daily	Predominantly used for refuse disposal
Pickering North	Metropolitan Toronto	0.2 m daily	In reserve
Britannia Road	Region of Peel	limited	Predominantly used for refuse disposal
<u>Other Agencies</u>			
Leslie Street Spit	Toronto Harbour Commissioners	1986	
Sam Smith Park	M.T.R.C.A.	2,000,000 m ³	
Promenade Park	Credit Valley C.A.	396,000 m ³	Includes 108,000 m ³ of rubble

Private

Hwy. 7 and Woodbine	Miller Paving		Former pit operation
Hwy. 27 and Major Mackenzie	Spencer Services		Former pit operation
Steeles and John Street	Sabiston		Former pit operation

POTENTIAL FILL DISPOSAL SITES

Municipal

Bellamy Ravine	Joint agency	5 years	Erosion control works
Bermondsey Creek	Metro/North York		Erosion control works
Metro Parks	Metropolitan Toronto	15,000 m ³ /year	Small landscaping projects

Other Agencies

Scarborough Waterfront	M.T.R.C.A.		Erosion control works
Scarborough-Ajax Sector	M.T.R.C.A.		Marina development
Jack Darlington Park	Credit Valley C.A.		Proposed expansion

Private

Railway Lands			Portions of the site may require fill
Toronto Brickyards		1,000,000 m ³	Site rehabilitation
Pit and Quarry Sites	Abandoned or closed	(See Appendix 4)	Site rehabilitation
Low/Wet Sites	Farmers	Unknown	Reclamation for development

APPENDIX 2

Inventory* of pits and quarries within 25 kilometers of Toronto's central business district.

Township

Vaughan	21 pits	(5 over 25 hectares in size)
Toronto Gore	0	
Part of Chinguacousy	1 pit	
Markham	7 pits	(1 over 25 hectares in size)
Pickering	16 pits	(2 over 25 hectares in size)
Mississauga	3 pits	(3 over 25 hectares in size)
	4 quarries	
	—	
Total	52	

* Source - M.N.R., 1983

APPENDIX 3

Minimum path-travel calculations* (peak hour by car) to the following:

Maple landfill	60 minutes
Pickering landfill	70 "
Beare Road landfill	50 "
Britannia landfill	55 "
Credit River (Promenade Park)	45 "

* Estimates are for one-way trips. Trucks require slightly longer travel time plus stop-over allowance for dumping.

AGENCIES/COMPANIES CONTACTED

Municipal Departments

- | | |
|----------------------|---|
| Borough of East York | - Building Department
- Planning Department
- Engineering Department |
| City of Etobicoke | - Building Department
- Planning Department
- Works Department |
| City of North York | - Building Department
- Planning and Development Department
- Public Works Department |
| City of Scarborough | - Buildings Department
- Planning Department
- Works Department |
| City of Toronto | - Buildings and Inspection Department
- Planning and Development Department
- Public Works Department |
| City of York | - Building Department
- Planning Department
- Works Department |
| Metropolitan Toronto | - Parks and Property Department
- Planning Department
- Works Department |

Ontario Ministries

- | | |
|-------------------|----------------------------------|
| Environment | Central Region |
| Natural Resources | Central Region
Maple District |

Other Public Agencies

Credit Valley Conservation Authority

Metropolitan Toronto and Region Conservation Authority

Ontario Hydro

Ontario Place

Toronto Harbour Commissioners

Private Agencies/Associations

Dufferin Aggregate

Eastern Construction Company Ltd.

Indusman Ltd. (quarry operation)

Metropolitan Toronto Sewer and Watermain Contractors Association

Milne and Nicholls Ltd. (construction)

Ontario and District Excavators Association

Poce Construction Ltd.

Rumble Construction Company (excavator)

Standard Aggregates

Toronto Construction Association

Toronto and District Excavators Association